

Interactions between the quasi 2-day wave and background atmosphere: a view from UARS data

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Abstract:

Recent observations from the Upper Atmosphere Research Satellite (UARS) have revealed detailed evolution and structures of the quasi 2-day wave in the mesospheric winds measured by the High Resolution Doppler Imager (HARDI) and in the stratospheric temperature measured by the Microwave Limb Sounder (MLS). The mechanisms that excite and maintain the wave are currently under investigation. The satellite observations suggest that the wave is a manifestation of both normal mode and unstable mode in the real atmosphere. As a normal mode, it has very organized phase and amplitude structures; while as an unstable mode, it shows a good correlation with a baroclinic instability index. The MLS observations suggest that the transient 2-day wave events may be related to strong atmospheric disturbances in the stratosphere and mesosphere, such as ones causing the stratospheric warmings. On the other hand, the HARDI observations reveal some consequences of these wave events showing that the mean zonal wind at 95km is accelerated as a result of the wave breaking.

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